

We claim:

5 1. A process for preparing lactones by catalytic carbonylation of oxiranes, wherein a catalyst system comprising

a) at least one cobalt compound as component A and

10 b) at least one metal compound of the formula (I) as component B,



(I)

15 where

M is an alkaline earth metal or a metal of group 3, 4 or preferably 12 or 13 of the Periodic Table of the Elements,

20 R is hydrogen or a hydrocarbon radical which may be substituted on the carbon atoms other than the carbon atom bound to M,

X is an anion,

n is a number corresponding to the valence of M and

x is in the range from 0 to n,

25 with n and x being selected so that the compound is uncharged,

is used as catalyst.

30 2. A process as claimed in claim 1, wherein the component A is selected so that a cobalt carbonyl compound is present under the reaction conditions.

3. A process as claimed in claim 1 or 2, wherein M in the formula (I) is Al, Mg, Zn or Sn.

35 4. A process as claimed in any of claims 1 to 3, wherein, in the formula (I), R is hydrogen or C₁₋₃₂-alkyl, C₂₋₂₀-alkenyl, C₃₋₂₀-cycloalkyl, C₆₋₁₈-aryl, C₇₋₂₀-aralkyl or

C₇₋₂₀-alkaryl, where substituents may be present on the carbon atoms other than the carbon atom bound to M,

and/or X is Cl, Br, I, sulfonate, oxide, C₁₋₃₂-alkoxide or amide.

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5. A process as claimed in any of claims 1 to 4, wherein the component B is AlCl_xR_{3-x} where x is from 0 to 3 and R is C₁₋₆-alkyl.

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6. A catalyst as defined in any of claims 1 to 5 with the exception of the combination Al(C₂H₅)₃/Co(acac)₃.

7. A process for preparing catalysts as claimed in claim 6 by mixing the components A and B.

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8. The use of a catalyst as claimed in claim 6 in carbonylation reactions.